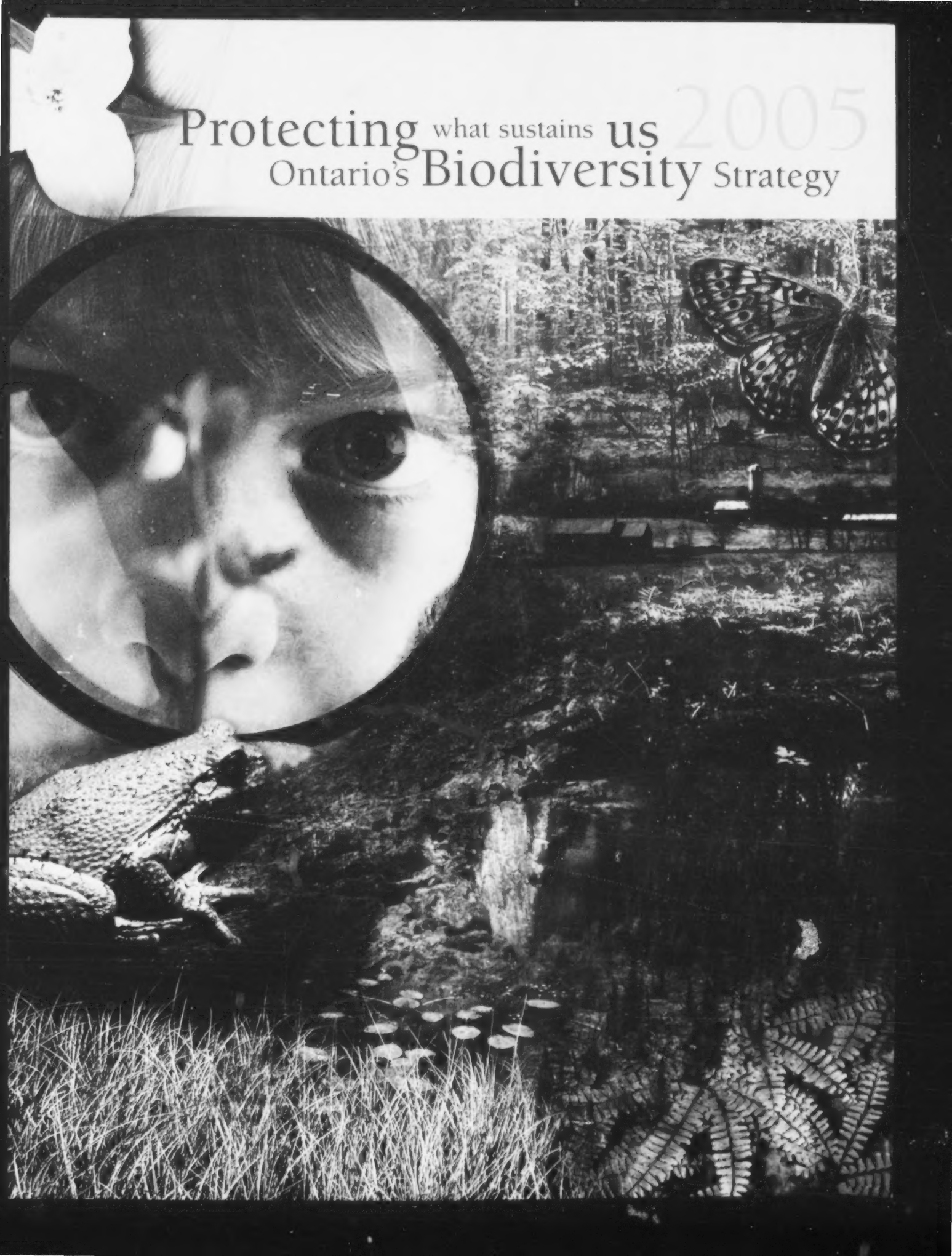
Protecting what sustains us
Ontario's Biodiversity Strategy

2005



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Minister's Message

Ontarians are fortunate to live in a province that is home to an abundant variety of plants, animals, birds, fish and insects, as well as the forests, wetlands, lakes and rivers they inhabit. This broad network of biological species and systems – our biodiversity – enriches our lives and provides us with clean water and air, as well as sources of food, wood, medicines and energy.

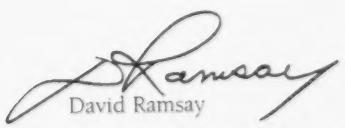
Conserving Ontario's biodiversity is key to achieving a healthy environment, strong communities and a thriving economy. It includes protecting the variety of ecosystems and plant and animal species in Ontario and using our natural resources sustainably for the benefit of Ontarians.

I am pleased that Ontario now has a biodiversity strategy to guide all of us as we move forward with this important task. To develop the strategy, the ministry led a process that brought together a broad spectrum of contributors, including industry, environmental groups, government agencies and members of the public. I am grateful to all of those who shared their time and knowledge.

Ontario's Biodiversity Strategy ensures we pass on a strong and health province to future generations. We will achieve its goals and realize its vision only if people across the province endorse the actions listed here and support them through their own actions.

You can contribute to this effort whether you have the expertise to become involved in the Science Forum or another of the groups proposed in the strategy, or simply want to learn more about biodiversity to become a good steward of your land.

I invite you to participate in this vital effort to conserve Ontario's variety of life and help pass it on to our children.



David Ramsay
Minister of Natural Resources

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Preface

Ontario's Biodiversity Strategy belongs to the people of Ontario, their children and grandchildren.

The process involved in developing this strategy reflects the fact that the end result belongs to a broad spectrum of our society.

Government can be a change agent and a partner in implementation, but cannot do so alone. Protecting the diversity of life on Earth – of which we are an integral part – requires broad societal consensus and participation.

It is a challenge not for some of us, but for all of us.

The strategy was generated through an inclusive process that invited the public and partners to participate. In October 2004, the Minister of Natural Resources brought together a representative group, including municipal, environmental, industry and Aboriginal leaders, to discuss moving forward on a biodiversity strategy. With their enthusiastic support, the process of developing a strategy was launched.

From the beginning, the public has been welcomed into the process through a web-based Biodiversity Workbook that provided information, identified issues for discussion and solicited feedback.

Teams consisting of individuals from government and non-government organizations were put to work drafting ideas about how to meet the challenges that Ontario faces and capitalize on its opportunities. Their ideas were critiqued by a team of reviewers. In this way, a constant flow of opinion and dialogue was encouraged.

More than 200 people, including individuals from over 20 non-government organizations, 12 provincial government ministries and agencies, the federal government, academic institutions and conservation authorities, volunteered as writing team members and reviewers.

A working draft of the proposed strategy was posted for initial public comment in March 2005. A final draft strategy was posted for comment in late April 2005 on the Environmental Bill of Rights (EBR) Registry website. The strategy was subsequently finalized, resulting in this document.

Developing a strategy is, of course, just the beginning. Ontario's Biodiversity Strategy will achieve its goals and realize its vision only if all Ontarians and all sectors of society engage in "*protecting what sustains us*".

Sleeping Giant Provincial Park

1.0 Introduction

Ontario's Biodiversity Strategy is about protecting what sustains us – our collective life support system.

> *Biological diversity or biodiversity refers to the variety of life, as expressed through genes, species and ecosystems, that is shaped by ecological and evolutionary processes.*

Ontario's Biodiversity Strategy adopts the definition of biodiversity that is used in the *Canadian Biodiversity Strategy* and the United Nations *Convention on Biological Diversity*. Biodiversity is the variability among living organisms from all sources, including *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems (*inter alia* means among other things).

The human species depends on biodiversity for its survival. The Earth's ecosphere cleans the air we breathe, recycles and purifies the water we drink, absorbs the waste we produce, provides us with food and fuel and shelter, stabilizes and moderates climate and generally nurtures our bodies and feeds our spirits with nature's beauty, both serene and wild.

The diversity of natural life also provides enormous economic and community benefits through the use of biological resources in forestry, farming, fishing, recreation and other activities. Many Ontarians livelihoods depend on the natural capital that is made possible by Ontario's rich biodiversity.

For millennia, humankind existed in balance, more or less, with the other parts of nature. But with growth in the world's population, the spread of industrialization, the sprawl of urban settlement and the intensive use of natural resources, the footprint that people have put on the Earth is now so large and so deep that we are overwhelming the capacity of our natural life support system to cope.

A clear sign that natural ecological processes are stressed is the global extinction of species. It is not just the numbers of species that are being lost that is of concern; it is the pace at which they are disappearing. This world-wide concern led to the 1992 United Nations *Convention on Biological Diversity*. This concern was reiterated in the 2005 Millennium Ecosystem Assessment's Biodiversity Synthesis Report. It has been estimated that fully one-quarter of all the species on Earth could be lost forever in the early decades of this century.[1] They are dying out for many reasons, including destruction of habitat, invasive species, disruption of the food chain on which they depend, the effects of harmful substances on reproduction, and over-harvesting.

Ecosystems can be very small, like a pond, or very large, like the Hudson Bay Lowlands, which make up about one-quarter of Ontario (some 25 million hectares). Ecosystems are characterized by what grows, lives and dies in that space and the interactions of air, water, soil, rock and living organisms. Earth's largest ecosystem is called the ecosphere.

Ontarians are fortunate to be the stewards of 107 million hectares of land and water. About two-thirds (about 70 million hectares) of the province is forested. Within this province, there are a quarter-million lakes, thousands of rivers and streams, and large portions of the Great Lakes, which hold nearly 20 per cent of the world's fresh water. A host of species have adapted to Ontario's climatic and other conditions.

Ontario is home to hundreds of vertebrate species, including more than 80 mammals and more than 470 bird species, about 60 reptile and amphibian species, more than 160 species of fish, and over 20,000 species of insects, spiders and other invertebrates. There are more than 3,380 species of plants and more than 1,000 species of fungi and algae, and hundreds of lichens and mosses.

Inventory programs in Ontario are discovering or rediscovering species that were either unknown here or thought to be lost. A dragonfly called the Mocha Emerald was recorded for the first time anywhere in Canada in 2003 as part of work on the Sydenham River Recovery Strategy in southwestern Ontario.

The only known Ontario population of an arctic-alpine plant called the Moss Campion was discovered in 2000 on an island in Lake Superior during a survey within the Lake Superior National Marine Conservation Area.

While Ontario still has large areas in the far north where human activity has had relatively little direct impact, ecosystems in southern Ontario, where the bulk of the population lives and works, are under enormous pressure. About 40 per cent of the species at risk in Canada occur in this province, and the majority of those species are found in southern Ontario. Ontario has been a leader in protecting its biodiversity – enacting the first legislation in Canada to protect specific species at risk – but biodiversity remains threatened here, as it is globally, by the cumulative impacts of industrialization and urbanization.

1.1 What Does It Matter?

What does it matter that we are losing some of the variety of natural life? There are several answers.

At the genetic level, diversity can provide living things with the potential to survive changes in their environment. The evidence is everywhere of how various species have evolved and adapted over time to live in different climates and ecosystems in different parts of the world. This adaptability, stored in their genes, is the key to their future.

1 *Environment Canada, Canadian Biodiversity Strategy, Ottawa, 1995, p. 12.*

Northern Bobwhite

In Ontario's far northern boreal forest, with its long cold winters, the lynx, with paws like snowshoes, can travel in the deep snow. Black spruce and jack pine dominate the forest because they can capture and photosynthesize sunlight at low temperatures. In contrast, in the rare savannahs of southern Ontario are tall grasslands, black oak trees, and butterflies like the Mottled Duskywing or birds like the Northern Bobwhite that depend on plants and seeds that flourish in warm open spaces full of sunlight.

At the level of the ecosphere, biodiversity maintains what are called "ecological services" which are basic to life on Earth. They include the production of oxygen and removal of carbon dioxide from the air by green plants, the breaking down of organic matter in the soil by fungi, bacteria and other organisms, and the storage and recycling of water within watersheds.

These "ecological services" are essential to human health, as well as the health of other living things. The availability and quality of water matters not only because we drink it, but because our lakes and rivers host an aquatic food chain from the tiniest phytoplankton to the biggest sturgeon. Biodiversity is essential to food production, which comes mainly from our lands and waters and is usually dependent on weather and climate, soil regeneration, and other ecological processes. Many crops (e.g., fruits) are the result of pollination by insects.

Some of the most common medicines we use are the result of biodiversity. Losing biodiversity means compromising our ability to find new medical and other solutions – perhaps a way to fight cancer in humans or algae with the potential to feed millions.

Approximately 1.7 million species, including bacteria, fungi, plants and animals, have been documented to date worldwide, but it is estimated there are many millions more, as yet undiscovered. The Global Biodiversity Assessment's 2001 Outlook provided a working estimate of 14 million species in total on Earth. Ontario is home to over 25,000 species, each with its own genetic diversity, and each living in association with many other species, in and as part of a variety of ecosystems.

Biodiversity provides natural capital that supports many economic, cultural and social benefits. For example, primary agriculture is valued at more than $3.3 billion. Ontario annually ships over $18 billion worth of forest products, including paper and wood to build homes and furniture – things we use every day with little thought to the diversity of tree species that allows all the different uses of our forests. Recreational uses such as camping, fishing, hunting, hiking and cottaging contribute substantially to the economy. Hunting and recreational fishing provide more than $2.6 billion in added value to the economy. Many tourists who visit Ontario also come to see its natural spectacle, whether it is the mighty waters of Niagara Falls or the autumn colours of Algonquin Provincial Park. Provincial parks receive over 10 million visitors each year and employ thousands of Ontarians.

Scientists tell us that there is still much to discover about biodiversity and how the many facets of biodiversity function. But we do know that the web of life is interactive. It is both local and global. Everything is interconnected. The loss of one plant may disrupt the intimate balance of life in a single ecosystem, affecting other plants, animals and insects that live there, while damage to habitat a continent away can render a local species at risk or even extinct.

The tiny, luminous Karner Blue Butterfly that once thrived in meadows in southwestern Ontario is considered extinct in Ontario as it is in some northeastern U.S. states. It is endangered elsewhere. The cause is habitat change, largely due to the exclusion of fire, which has resulted in unsuitable habitat that has decimated the wild lupine plant on which the butterfly larvae feed.

Monarch Butterfly

Drastic fluctuations in the populations of the familiar orange and black Monarch Butterfly (in the last decade) have been attributed in part to deteriorating forest habitat 5,000 km away in Mexico, where the Monarchs that live east of the Rockies migrate during the winter. There are also growing concerns about their habitats on their migration paths.

We also know that ecosystems are not static. They are resilient and are often shaped by disturbances such as fire that result in ever-changing patterns of vegetation.

Biodiversity contributes to our quality of life in ways that are more difficult to define. Ontario's variety of landscapes and species is important to our cultural and artistic expression. For many Ontarians, getting outdoors and away from concrete and artificial light and noise is a way to renew the spirit. Seeing a butterfly or hearing a bird call in a city garden provides a moment of wonder and delight.

It is also important to remember that species and ecosystems have evolved over thousands and millions of years, and most were here prior to the arrival of humans. They have their own intrinsic value. However, they are now becoming extinct at an increasing rate not because of normal processes of evolution, but through the ever increasing impact of human activity globally.

1.2 Ontario's Strategy

This strategy is not about nature versus people. It is about living sustainably and respecting nature. Ontario's natural assets can be viewed as a bank account. The challenge of sustainable living and sustainable development is for us to find ways of living off nature's interest without depleting nature's capital. If we deplete or disrupt our natural capital to the point where it is no longer self-renewing or it is simply gone and cannot be recovered, we risk Ontario's future economic and social viability, as well as our health and quality of life.

This strategy sets out a plan in which all Ontarians, communities and sectors of society can and must play an important role. Its vision is about sharing responsibility for conserving Ontario's biodiversity. As we pursue this vision, the significant growth that is forecast for Ontario (i.e. four million additional people by 2030) needs to be planned in a responsible manner. We need to ensure that Ontario's biodiversity is conserved as our population grows.

The strategy, after briefly describing Ontario's four major ecological regions, presents a vision for the future and the strategy's goals and principles. It then outlines the threats we face and the opportunities we have in Ontario, before moving on to a series of strategic directions, supported by a number of recommended actions. The strategy concludes with a discussion about implementation.

1.3 Ontario's Ecological Regions

Hudson Bay Lowlands: The northernmost ecozone encompasses almost 25 per cent of the province, and is located north of the Precambrian Shield where limestone bedrock underlies the area along the coasts and inland from Hudson Bay and James Bay. Ontario's largest protected area, Polar Bear Provincial Park, is located in the north of this ecozone along the coast. Major human activities in this region include fishing, hunting and trapping. The region includes many smaller wetland ecosystems and open upland coniferous forests (taiga). Species in this zone include:

Mammals:	Arctic Fox, Polar Bear
Plants:	Rock Sedge, Glasswort, Elephant-head
Insects:	Melissa Arctic Butterfly
Birds:	Snow Goose, Hudsonian Godwit, Willow Ptarmigan
Fish:	Brook Stickleback

Ontario's Ecological Regions

Hudson Bay Lowlands

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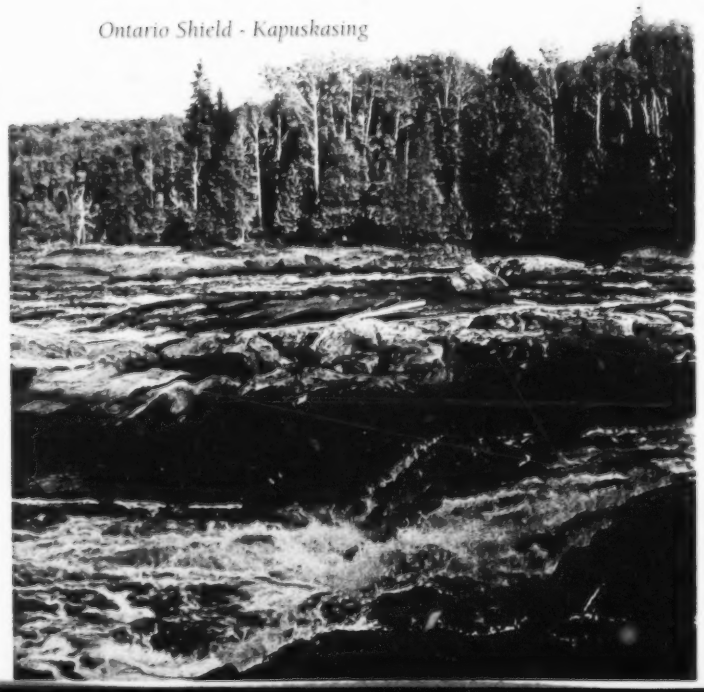
Hudson Bay Lowlands

Ontario's Ecological Regions

Ontario Shield: This ecozone occupies some 60 per cent of Ontario. The Precambrian Shield underlies this area, extending from the Hudson Bay Lowlands and the limestone in the north to the limestone bedrock in the south. Fire, insects and wind are important forces of change in the Ontario Shield's forests. Coniferous forests composed of black spruce, balsam fir, jack pine, and tamarack dominate in the north. In the south, mixed forests and deciduous forests of tolerant hardwoods (e.g., sugar maple and beech) are more frequent. Wetlands, including peatlands, are abundant. Mining, logging, fishing, trapping, hunting and camping are major activities in this region. Species in this zone include:

Mammals:	Eastern Timber Wolf, Moose, Woodland Caribou
Plants:	Reindeer Moss, White Pine
Insects:	Denike's Tiger Beetle
Birds:	Bay-breasted Warbler, Common Loon
Fish:	Northern Pike, Lake Trout, Walleye
Amphibians:	Boreal Chorus Frog
Molluscs:	Eastern Elliptio

Ontario Shield - Kapuskasing



Mixedwood Plains: Ontario's southernmost ecozone, occupying less than 10 per cent of the province, is located on the limestone south of the Precambrian Shield. The Ontario portion of this ecozone is bounded in the south and west by Lake Huron, Lake Erie, Lake Ontario and the St. Lawrence River. Vegetation is diverse, characterized by mixed deciduous-evergreen forests and tolerant hardwood forests. Alvars and tallgrass prairies also occur. Wetlands are numerous in certain areas, although many wetlands have been drained. Carolinian Canada (the most southerly portion of this ecozone) boasts the highest concentration of species in Canada (e.g., some 2,200 herbaceous plant, 70 tree and almost 400 bird species). The Mixedwood Plains ecozone has the highest human population density and concentration of industry, as well as important agricultural activities, including such crops as corn, soybeans, hay and apples, and dairy and beef cattle farming. Species in this zone include:

Mammals:	White-tailed Deer, Southern Flying Squirrel
Plants:	Eastern Prairie Fringed-orchid, White Trillium, Bitternut Hickory
Insects:	Monarch Butterfly
Birds:	Barred Owl, Wild Turkey
Fish:	Brook Trout
Reptiles:	Snapping Turtle, Five-lined Skink
Molluscs:	Northern Rifflesheil

Mixedwood Plains

Great Lakes: The Great Lakes cover 9 per cent of the province and, in their entirety, contain almost 20 per cent of the Earth's freshwater. The lakes support thousands of wetlands, and a variety of aquatic and terrestrial organisms. Ontarians are responsible for the care of large portions of Lake Superior, Lake Huron (including Georgian Bay), Lake St. Clair, Lake Erie, Lake Ontario, and the St. Lawrence River. Transportation, fishing and cottaging are major human activities on the Great Lakes. A significant number of industries are located on or near the shores of the Great Lakes. There are 49 ports on the Ontario portion of the Great Lakes shoreline through which millions of tonnes of cargo are shipped each year. Species in this region include:

Plants:	Pitcher's Thistle, Swamp Rose-mallow, Moss Campion
Insects:	Lake Huron Locust
Birds:	Ring-billed Gull, Caspian Tern
Fish:	Lake Herring, Lake Sturgeon
Amphibians:	Fowler's Toad, Mudpuppy
Reptiles:	Lake Erie Watersnake, Map Turtle
Molluscs:	Wavy-rayed Lampmussel

Great Lakes

White Pelicans, Lake of the Woods

2.0 Looking Ahead

2.1 A Vision for the Future

Looking ahead, where do we want Ontario to be? We envision a future in which:

Together, we have halted the loss of biodiversity and advanced the job of recovery. In key areas under threat from human development, we have restored ecological integrity and brought back endangered species to self-sustaining levels.

All Ontarians recognize that we must live within nature's means – that the Earth does not have an endless capacity to tolerate and absorb the impacts of human activity. We place a high value on our natural heritage and the many benefits that it provides. We are determined to pass our rich natural heritage on to future generations.

Sustainable living is a priority and regarded as a responsibility by all sectors of society – government, business and industry, communities, institutions and organizations, and individual Ontarians.

Ontario has a sustainable economy in which human needs are met, but human consumption and production do not deplete biodiversity. Ecological assets are included in our indicators of environmental, social, cultural and economic progress.

The health of species, including humans, and ecosystems has improved. We have removed some of the most harmful substances that were systematically accumulating in nature, and we have reduced pollutants in our water, air and land.

Urban sprawl has been contained, farmland is no longer being lost in southern Ontario and northern communities are healthy.

Ontario's successful biodiversity strategy is part of a strong, globally significant effort to protect biodiversity and ensure sustainable use of biological assets.

This kind of fundamental change will not happen unless we can capture the imagination and inspire the commitment of the Ontario public. We must create major generational change in attitudes and behaviours over the next 20 to 25 years, while at the same time ensuring that Ontario's biodiversity is conserved. This strategy is meant to begin the process of stimulating interest, involvement and action.

2.2 Biodiversity Goals

Two goals define the conservation path proposed in this strategy:

Goal 1: Protect the genetic, species and ecosystem diversity of Ontario.

Goal 2: Use and develop the biological assets of Ontario sustainably, and capture benefits from such use for Ontarians.

Both goals are essential to ensure that Ontario's natural heritage endures. Therefore, we must aim to achieve ***both*** goals. Together, they represent a balanced and realistic approach.

It has been more than 15 years since the international Brundtland Commission challenged the notion that economic and environmental interests must compete against each other. But it has been difficult to move the debate away from the belief that we can be either prosperous or "green". The strategy's two goals are aimed at recognizing the importance of the economic, social and cultural benefits of biodiversity, as well as its ecological and intrinsic values.

We may elect in some parts of Ontario to pursue, for example, activities conducive to the protection of wilderness (such as the creation of wilderness parks) while in other areas we may pursue sustainable forest management or sustainable agriculture. In other areas we will continue to build cities and seek industrial development.

Increasingly, we have to choose among land and water use options for a specific area:

- Natural areas that are protected from use and development
- Other areas in which natural resources are managed for sustainable use
- Areas devoted to sustainable agriculture
- Areas dominated by urban and industrial development.

Within each of these options, there is a need to pay attention to ecosystem health.

Ecosystem health can be characterized as a measure of the level of distress in the ecosystem, its resilience and adaptability, the ability to sustain itself, the degree to which adjacent ecosystems are affected and the extent to which the ecosystem supports healthy human communities.

This strategy does not pretend that we will achieve our goals quickly or easily. It acknowledges that there are many threats and obstacles in our path, as well as opportunities. It sets out long-term direction and practical steps that can be achieved, measured and reported on in the next five years. Where possible, it identifies a range of stakeholders who can lead the effort to develop solutions. It seeks to involve all Ontarians in decisions about the biodiversity for which they are stewards.

2.3 The Wider Context

Over the past 25 years, countries around the world have recognized that the power of human activity to alter our ecosphere must be brought into better balance with the capacity of the Earth to absorb human impacts.

The 1980 *World Conservation Strategy* and the 1987 report, *Our Common Future*, by the World Commission on Environment and Development (popularly known as the Brundtland Commission) laid the groundwork.

In 1991, the World Conservation Union (IUCN), the United Nations Environment Program (UNEP) and the World Wildlife Fund partnered to update the 1980 *World Conservation Strategy* with *Caring for the Earth: a Strategy for Sustainable Living*.

The United Nations (UN) ***Convention on Biological Diversity*** was completed at the Earth Summit in Rio de Janeiro, Brazil, in 1992. The World Resources Institute, the IUCN and UNEP sponsored the ***Global Diversity Strategy: Guidelines for Action to Save, Study and Use Earth's Biotic Wealth Sustainably and Equitably***, which complements the UN Convention.

The convention has since led to an international agreement which commits nations to achieve, by 2010, a significant reduction in the current rate of biodiversity loss.

Canada was the first industrialized nation to ratify the convention in December, 1992. Canada published the *Canadian Biodiversity Strategy* in 1995. Its vision is "a society that lives and develops as part of nature, values the diversity of life, takes no more than can be replenished and leaves to future generations a nurturing and dynamic world, rich in its biodiversity."

Five-lined Skink

2.4 Biodiversity Principles

Following the Rio Earth Summit, Canada developed the *Canadian Biodiversity Strategy* (Environment Canada, 1995) to respond to the United Nations *Convention on Biological Diversity*. The *Canadian Biodiversity Strategy* was adopted by federal, provincial and territorial ministers on behalf of their respective governments. The following principles of the *Canadian Biodiversity Strategy* will continue to provide a guiding framework for Ontario's efforts through Ontario's Biodiversity Strategy:

- Biodiversity has ecological, economic, social, cultural, and intrinsic values.
- All life forms, including humans, are ultimately connected to all other life forms.
- All Canadians depend on biodiversity and have a responsibility to contribute to biodiversity conservation and to use biological resources in a sustainable manner.
- All Canadians should be encouraged to understand and appreciate the value of biodiversity and to participate in decisions involving the use of our air, water, land, and other resources.
- An ecological approach to resource management is central to conserving biodiversity and using our biological resources in a sustainable manner.
- Development decisions must reflect ecological, economic, social and cultural values.
- Healthy, evolving ecosystems and the maintenance of natural processes are prerequisites for the *in-situ* conservation of biodiversity and the sustainable use of biological resources.
- *Ex-situ* measures may be required to support the conservation of some species and populations and are essential to ensuring the sustainable use of many agricultural, forest and aquatic resources.
- The knowledge, innovations and practices of indigenous and local communities should be respected, and their use and maintenance carried out with the support and involvement of these communities.
- The conservation of biodiversity and the sustainable use of biological resources should be carried out using the best knowledge available and approaches refined as new knowledge is gained.
- The conservation of biodiversity and the sustainable use of biological resources requires local, regional, provincial, territorial, national and global cooperation and a sharing of knowledge, costs and benefits.

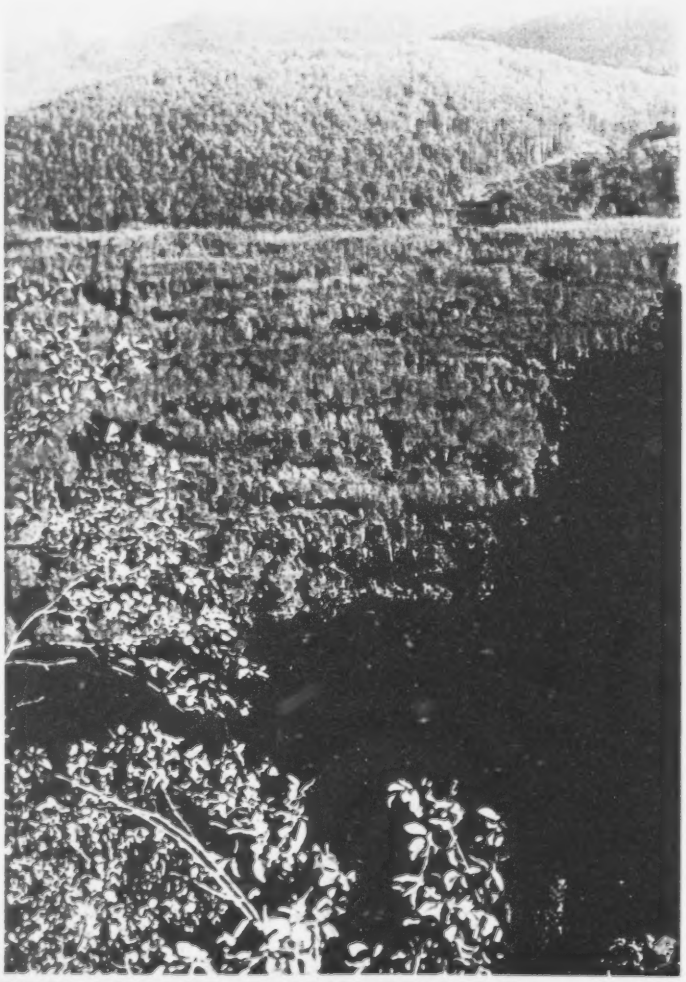
This strategy also recognizes and supports Principle 15, "the precautionary approach" (see Glossary) from the 1992 *Rio Declaration on Environment and Development*.

3.0 Threats to Biodiversity

Natural ecosystems are dynamic and resilient and have evolved in response to a variety of forces and factors. But they are limited in their ability to adapt to rapid changes, many of which are introduced through human activities.

In global terms, Ontarians are endowed with an enviable amount of space per capita. But a lot of that space is in the north, while most Ontarians and the province's industry are located along the Great Lakes and the border with the United States. As the population of southern Ontario grows and lands are converted to urban, suburban and industrial land uses with coincident pollution, the ability and capacity of the environment to support healthy human populations and biodiversity is further reduced.

Nor' Wester Mountains, Thunder Bay area



The current population of Ontario is more than 12 million. It is expected to increase by more than four million, or by one-third, by 2030. Continued population growth and increased demand for goods and services will impact Ontario's biodiversity. The challenge is to minimize the potential impacts.

From a global perspective, humans can disrupt and degrade biodiversity and its life-supporting ecosystems in four basic ways:

- **Pollution**: We contaminate ecosystems with chemical compounds extracted from the Earth's crust (such as heavy metals and fossil fuels) and with manufactured compounds, including chemicals that persist or bio-accumulate, such as hormone disrupting substances, polychlorinated biphenyls (PCBs), dioxins, ozone depleting chemicals, and many more not naturally found in nature.
- **Habitat Loss**: We physically encroach on the Earth's ecosystems through road-building, hydro-electric power development, forestry, mining, agriculture, urban sprawl and other activities. These activities can degrade, eliminate and/or fragment habitat. The cumulative impact of a series of seemingly small habitat losses can be significant.
- **Invasive Species**: We move species around intentionally or accidentally introducing them into ecosystems where they did not naturally live and evolve.

- Unsustainable Use: We use too many ecosystems and their species in unsustainable ways.

It is important to note that climate change and combinations of impacts are also placing biodiversity increasingly at risk. In addition, a major underlying challenge for efforts to manage the above threats has been the lack of public awareness and commitment to biodiversity conservation.

The Millennium Ecosystem Assessment (MA) Synthesis Report, prepared by 1300 experts from 95 countries, was released March 30, 2005. The MA concludes that, over the past 50 years globally, humans have changed ecosystems rapidly and extensively, resulting in a substantial and largely irreversible loss to the Earth's biodiversity. While these changes have contributed to substantial net gains in human well-being and economic development, these gains have resulted in the degradation of the "ecosystem services" that support life. This degradation could grow significantly worse during the first half of this century.

3.1 Pollution

Pollution is emitted in many different forms, including atmospheric pollution (e.g., sulphur and nitrogen oxides), soil and water pollution (e.g., nitrates and phosphates), pesticides, particulate matter, and heavy metals. There are thousands of pollutants circulating through the Earth's ecosystems, and many of these materials have significant, large-scale impacts, such as acid rain on boreal and deciduous forests and associated aquatic ecosystems. Pollution can also disrupt ecological processes.

At the individual and population level, manufactured chemicals and pollutants contribute to a variety of health issues in people and wildlife, including cancer, birth defects, behavioural changes and chronic illness. Synthetic chemicals that block, mimic or interfere with natural hormone production have been blamed for causing abnormalities in reproduction, growth and development, particularly in fish and amphibians. Some chemicals deplete the ozone layer, which allows increased ultraviolet (UV) radiation to reach the Earth. For example, UV rays can be especially damaging on ecosystems in the early spring when vegetation is young and fish and frogs lay their eggs in shallow water. Human health (e.g., skin cancer) and some food crops are also vulnerable to the effects of a depleted ozone layer. There is also a growing concern about light pollution and its impacts on biodiversity (e.g., migrating birds, amphibians and plant dormancy).

3.2 Habitat Loss

Habitat loss, alteration and fragmentation directly affect the species that rely on the habitat that is being changed. Habitat loss is particularly serious in southern Ontario where urbanization, agriculture and road density are greatest. Within southern Ontario, some of the province's rarest biodiversity is also found (e.g., alvars and tallgrass prairies). In the north, resource extraction (i.e. forestry and mining), hydro-electric power development and associated roads and bridges can impact biodiversity through habitat changes and/or degradation of local waterbodies. In addition, recreational activities (e.g., overuse of campsites, use of all-terrain vehicles, boating and rock-climbing) can destroy local vegetation, pollute waterways and/or disturb wildlife.

Ontario's wetlands constitute almost one-third of the provincial land base or about 29 million hectares. Wetlands – marshes, fens, bogs and swamps – are among the most productive and biologically diverse habitats on earth and are an essential component of healthy natural ecosystems. Ontario has approximately 24 per cent of Canada's wetlands and 6 per cent of the world's wetlands. By the 1980's, 68 per cent of the original wetlands south of the Precambrian Shield were converted to other uses. Wetland losses have continued.

String Fen, Flanagan River

- **Unsustainable Use**: We use too many ecosystems and their species in unsustainable ways.

It is important to note that climate change and combinations of impacts are also placing biodiversity increasingly at risk. In addition, a major underlying challenge for efforts to manage the above threats has been the lack of public awareness and commitment to biodiversity conservation.

The Millennium Ecosystem Assessment (MA) Synthesis Report, prepared by 1300 experts from 95 countries, was released March 30, 2005. The MA concludes that, over the past 50 years globally, humans have changed ecosystems rapidly and extensively, resulting in a substantial and largely irreversible loss to the Earth's biodiversity. While these changes have contributed to substantial net gains in human well-being and economic development, these gains have resulted in the degradation of the "ecosystem services" that support life. This degradation could grow significantly worse during the first half of this century.

3.1 Pollution

Pollution is emitted in many different forms, including atmospheric pollution (e.g., sulphur and nitrogen oxides), soil and water pollution (e.g., nitrates and phosphates), pesticides, particulate matter, and heavy metals. There are thousands of pollutants circulating through the Earth's ecosystems, and many of these materials have significant, large-scale impacts, such as acid rain on boreal and deciduous forests and associated aquatic ecosystems. Pollution can also disrupt ecological processes.

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String Fen, Flanagan River

3.3 Invasive Species

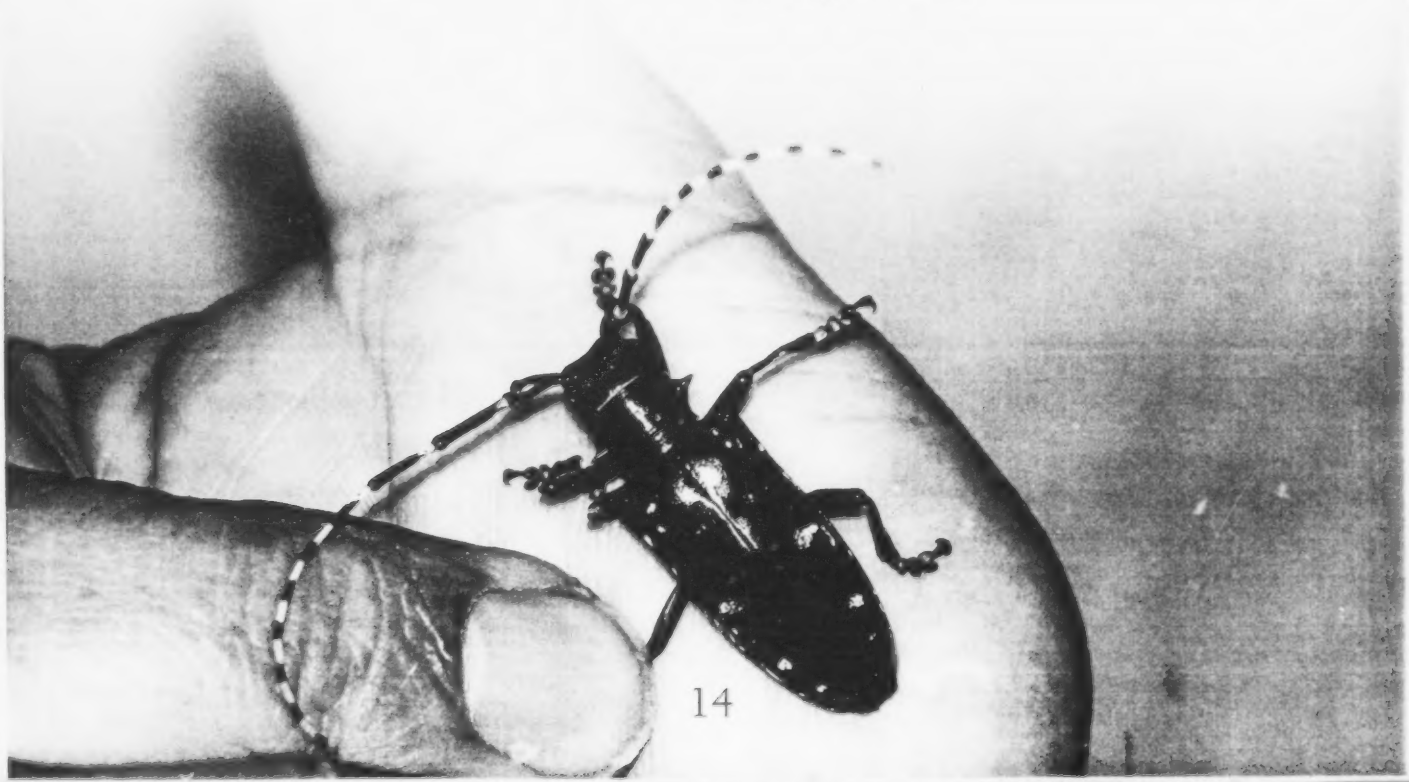
Alien species are plants, animals, and micro-organisms that have been accidentally or deliberately introduced into habitats outside their normal range. Invasive species are those harmful alien species whose introduction or spread threatens the environment, the economy and/or society, including human health. Invasive species originate from other continents, adjacent countries or from other ecosystems within Canada.

Free from predation and competition that would normally limit their distribution and abundance in their natural habitats, many of these invasive species reproduce prolifically, infest and damage, displace or destroy native species an/or ecosystems (e.g., emerald ash borer), agricultural crops (e.g., plum pox virus), wetlands (e.g., purple loosestrife) and lakes and rivers (e.g., zebra mussel), inflicting significant ecological and economic damage. The zebra mussel, for example, disrupts ecosystem composition and structure, clogs water intake pipes, and affects public beaches (by cutting bathers' feet). It is but one of 160 invasive species that have been introduced into the Great Lakes (e.g., through ballast water release).

3.4 Unsustainable Use

Unsustainable use is the harvest by individuals at a rate higher than can be sustained by the natural reproductive capacity of the population being harvested. In Ontario, for example, wild American ginseng has been over-harvested from its natural woodland habitat to the point of being endangered. In addition, unsustainable use can impact the genetic integrity of a species through improper harvesting and in other instances jeopardize a species' ability to maintain its traditional role(s) in ecosystem composition, structure and function. Unregulated, unsustainable and/or illegal harvest of some species remains a concern. Regulation of resource harvest through education and effective enforcement, along with a commitment to conservation among fishing, hunting and trapping communities, has contributed to the sustainable harvest of many game and commercial fisheries and game wildlife species.

Asian Long-horned Beetle



3.5 Climate Change and Other Cumulative Impacts

People have added carbon dioxide, nitrous oxide, methane and other greenhouse gases to the atmosphere by extracting and burning fossil fuels such as coal, oil and natural gas. In addition, the drainage of wetlands and the conversion of forests and grasslands to other uses such as urban development also have contributed to the release of greenhouse gases to the atmosphere as carbon stored in these ecosystems is released by decomposition.

Atmospheric carbon dioxide has increased 30 per cent since pre-industrial times, and these additional greenhouse gas molecules have trapped heat and accelerated the rate of global warming and climate change. Climate change will increasingly impact biological diversity in many ways:

- Insect and/or disease outbreak patterns may change and/or become more severe.
- Plant species will change their distribution, resulting in new types of forest. It is possible that a significant part of the boreal forest may be displaced by tree species from the south or converted to grassland over time. The pace of climate change will outstrip the ability of some species and/or ecosystems to adapt.
- Animal species distributions will continue to change. For example, the white-tailed deer and the Virginia opossum now survive hundreds of kilometres north of their historic range.
- An increase in the frequency of extreme events (like the ice storm that hit eastern Ontario and Quebec in 1998, forest fires and droughts) may affect habitats, particularly habitats that are localized (i.e. separated from other natural areas which might provide a source for replenishing a species that is extirpated locally).

The cumulative impacts of pollution, habitat modification, the unprecedented (intentional and accidental) global redistribution of species and over-harvesting place many ecosystems at risk.

These cumulative impacts affect ecosystems in different ways, at different times and at different scales. They cause alteration, reduction and/or loss of ecosystem function, populations and species, degradation, loss and fragmentation of habitat. They also damage human health – in inner cities, for example, asthma is the leading cause of hospitalization of children.

The diverse threats to biodiversity requires an integrated, adaptive approach to caring for Ontario's natural assets and an approach that involves all sectors of society. Participation by all sectors is critical because the loss or degradation of biodiversity not only affects ecosystem function, but it also damages society's ability to generate wealth and support livelihoods.

Aurora Trout

The *Species at Risk in Ontario* list includes:

- 10 extirpated species (no longer exist in the wild in Ontario, but still exist elsewhere)
- 40 endangered species (facing imminent extinction or extirpation in Ontario) and regulated under the provincial Endangered Species Act
- 32 endangered species that are candidates for regulation under the act
- 44 threatened species (at risk of becoming endangered if limiting factors are not reversed)
- 46 species of special concern (species with characteristics that make them sensitive to human activities and/or natural events).

Woodland Caribou Provincial Park

4.0 Opportunities

While there are serious threats to biodiversity in Ontario, there are also opportunities to identify and implement solutions. The threats that were described in the last section are not being ignored in Ontario. Efforts to date have reduced risks. Efforts continue, work is being done – but not on the scale that is required to reduce risks further and to monitor the effectiveness of our actions.

The opportunities described below are presented as starting points or foundational elements for achieving the goals of this strategy and, in particular, placing biodiversity on the public agenda. They are not a comprehensive listing, but include some examples of important actions or achievements on which we can build.

4.1 Ontarians Care

Ontarians care about the environment, and many participate in efforts to conserve biodiversity. Biodiversity may not be a household term, but we know that Ontarians do care about clean air and water. Rising concern has been expressed about the smog that blankets not only our large cities, but also blows northward, affecting lands, waters and communities far from the sources of pollution. There is a growing appreciation of the importance of protecting our water supply.

Ontario households participate actively in 3Rs (reduce, reuse and recycle) programs to try to control our production of garbage. Issues like dwindling landfill capacity and shipping garbage along transportation corridors have captured considerable public attention in recent years. This environmental concern and commitment can be tapped to support biodiversity conservation.

Ontario has a number of organizations that are dedicated to environmental and conservation issues and raise awareness and funds through donations for their important activities. These organizations include but are not limited to cottager associations, hunting and fishing federations, public parks supporters and birdwatchers. Many are involved in voluntary programs like cleaning up natural areas and monitoring water quality or wildlife.

The Ontario Breeding Bird Atlas is a volunteer-based five-year project to gather data on the breeding distribution of all the bird species that breed in Ontario. Data collection for the second atlas began in spring 2001 and will continue through 2005. As of July 15, 2004, more than 1,300 participants have contributed more than 94,000 hours in the field, checking more than 40,500 locations, and recorded breeding evidence for 288 species.

The Sydenham Sportsman Association, based in Owen Sound, leads many volunteer biodiversity conservation projects, including stream restoration, providing nesting boxes for bluebirds, kestrels and bats, and coordinating annual stream clean-ups. The association assisted in the restoration of the largest spawning channel east of the Rockies.

We can build on Ontarians' interest in the environment and biodiversity to create support and momentum for this strategy. Our population is better educated and better informed than ever before, and we have to work harder to get their attention. One of the best places to start is with young children who are fascinated by the natural world, and who need opportunities to learn more in outdoor settings.

In October 2004, the York Region District School Board opened the Sibbald Point Outdoor Education Centre. This joint venture between the school board and Ontario Parks will allow up to 7,000 students a year to gain an understanding and appreciation of nature through guided visits in the park.

4.2 A Solid Foundation

Ontario has a foundation of legislation and policy on which to build actions to protect biodiversity and sustainably use and develop biological assets. Ontario's established and recognized legislative and policy framework supports:

- Sustainable forest management on Crown lands
- Sustainable agriculture
- Sustainable wildlife
- Protection of species at risk
- A system of parks and protected areas
- Protection of cultural landscapes and individual tree specimens under the Ontario Heritage Act
- An environmental assessment process
- An Environmental Bill of Rights
- Environmental controls on a variety of emissions and discharges into land, air and water
- Environmental monitoring for public health purposes (e.g., smog alert)
- Local planning guidelines with direction to take natural heritage into account
- Protection of water sources and regulation of water quality
- Watershed-based planning
- A greenbelt initiative
- Incentives for landowners to protect natural areas.

We need to build on and strengthen this foundation through the implementation of this strategy. The examples of Ontario's legislative and policy framework mentioned above have evolved over time, and will continue to evolve and be updated, with the benefit of new scientific knowledge, with the input of Ontarians, and in partnership with other levels of government, communities and relevant sectors of the economy. There is an opportunity to strengthen the application of a biodiversity "screen" to this framework – one that examines initiatives and policies in light of the importance of the multiple values of biodiversity (economic, social, cultural, ecological and intrinsic).

More than 27,300 farmers participated in the Environmental Farm Plan (EFP) program from 1993 to 2004. Two thousand workshops were held for farmers to learn more about environmentally sound practices that provide benefits for biodiversity. The program provided incentive funding to implement farmers' environmental plans. Farmers themselves invested $45 million in these projects, with $15 million in federal incentive funds. The Ontario Farm Environmental Coalition is leading the next generation of the EFP program with federal and provincial partners to promote further the adoption of management practices that will contribute to biodiversity conservation on Ontario farms.

4.3 A Legacy for the Future

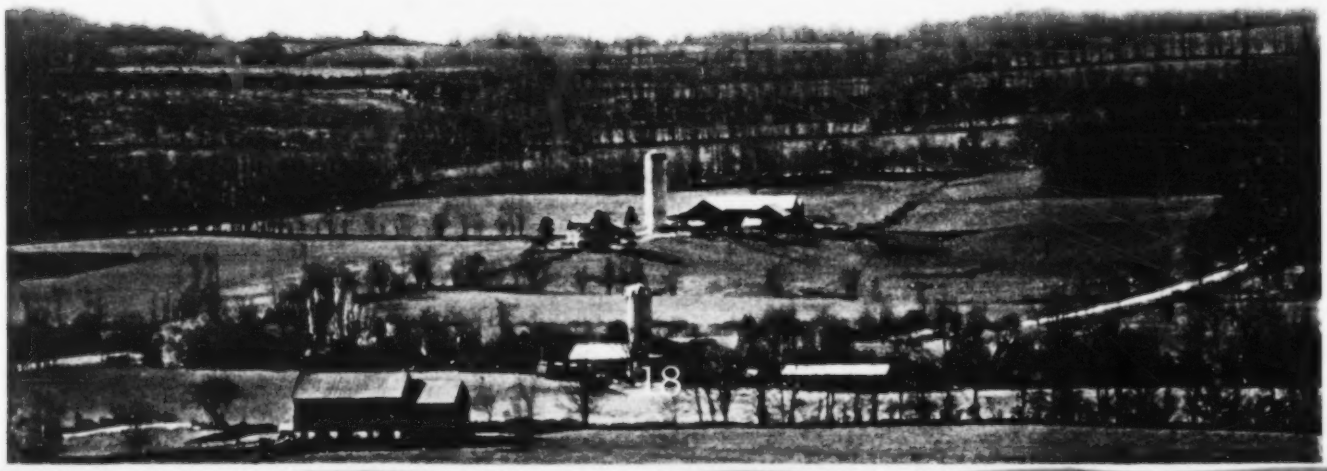
Ontario still has an abundance of species. There are still intact, self-sustaining ecosystems populated with a variety of native species. In the far north, Aboriginal communities have a culture of living off the land and in relative harmony with their natural environment. But even in the more urbanized and congested areas of southern Ontario, the efforts of many organizations are having a positive impact.

There is growing alarm in the scientific community about climate change and the cumulative impact of the loss of biodiversity on a global scale. That said, we do not want to convey the impression that we are past the point of no return. We can still recover, rehabilitate and pull back from a significant loss of Ontario's biodiversity.

We are at a critical point in Ontario, however, if we are going to keep what we have. Therein lies the opportunity – to take action now and over the near term to make sure that we will be able to pass this natural heritage on to our children and grandchildren.

For example, through Ontario's Living Legacy, 378 new parks and protected areas covering 2.4 million hectares were added to the existing system. Almost 90 per cent of these new parks and protected areas have been regulated since 1999 under the Provincial Parks Act and the Public Lands Act. The rest are protected under interim provisions that prevent logging, hydro-electric power development and the staking of new mining claims.

The World Wildlife Fund Canada's (WWF) first-ever nature audit, published in 2003, recognized Ontario's action in achieving ecological representation targets in its parks and protected areas. The WWF was also encouraged by work on the Northern Boreal Initiative. The Northern Boreal Initiative involves building cooperative relationships among First Nations, governments, and environmental groups to explore land use and resource allocation north of the 51st parallel that will benefit the economies of Aboriginal communities, provide access to additional forest resources, and protect the region's ecosystems.



4.4 Working Together

The effectiveness of working together – within and across communities, organizations and sectors – to achieve mutually beneficial outcomes for biodiversity, the environment and the economy has been demonstrated. Over the last few years, partnerships have become the accepted way of operating. There is wide recognition that organizations can do far more with partners than they can by going it alone. The solutions to most issues today lie in a cooperative, partnership approach.

The Ontario Forest Accord is a good example. The accord was reached by representatives of the forest industry, conservationists and the provincial government. They agreed on a significant expansion of Ontario's parks and protected areas, while also protecting the wood supply for the forest industry and jobs for northern communities. They established an advisory group that developed principles for sharing permanent increases in wood supply between the forest industry and new protected areas to contribute to the completion of a protected areas system in the future.

Recovery teams are another good example of working together. There are 56 active recovery teams for species at risk in Ontario (49 species-based teams and seven ecosystem-based teams). The teams develop recovery plans through a consultative process involving local landowners, community leaders and others. There have been recovery strategies developed for tallgrass prairie communities, Lake Huron dune grasslands, Lake Erie sand spit savannahs and watershed recovery plans for the Sydenham, Thames and Ausable rivers.

Over the past decade, a unique Carolinian Canada partnership has promoted the conservation of the remaining natural areas in Ontario's far south. The partnership is sponsored by the World Wildlife Fund, the Nature Conservancy of Canada and Wildlife Habitat Canada. Several other organizations, including the Ontario Heritage Foundation, Ontario Nature, local Conservation Authorities and the Ministry of Natural Resources, have played important roles. Many private landowners are contributing by conserving habitats and rare species on their own properties.

Ontario's Natural Heritage Information Centre helps to identify, document and track Ontario's native species and natural areas, particularly species that may be at risk. Its partner organizations include Bird Studies Canada, Ducks Unlimited Canada, Ontario Nature, the Nature Conservancy of Canada and the Ontario Ministry of Natural Resources. The centre provides a central repository for information on biodiversity.

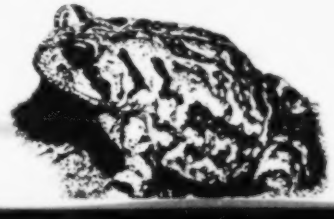
4.5 Expanding and Sharing Knowledge

Scientific knowledge about biodiversity is growing rapidly, and practical solutions to address protection, sustainable use and recovery issues are being developed through the work of the scientific community. For example, five Chairs in Biodiversity have been recently appointed at Ontario universities.

There are five Chairs in Biodiversity at Ontario universities. A number of important partnerships involving the private and public sectors in agriculture, forestry and other areas are developing new solutions through scientific research. In the field, multidisciplinary recovery teams are calling on the expertise of scientists from many different institutions and organizations.

The Sydenham River Recovery Team has representatives of three stewardship councils (Lambton, Kent and Middlesex), the St. Clair Region Conservation Authority, the University of Guelph, the Royal Ontario Museum, Environment Canada, the federal Department of Fisheries and Oceans, and the Ontario Ministry of Natural Resources. Development of the recovery strategy involved extensive public consultations. Finalized in 2002, the recovery strategy includes a range of initiatives, including mapping of species at risk, improving stream crossings, working with local farmers on such issues as livestock waste management, working with local planners on municipal plans affecting natural heritage, and raising public awareness.

Fowler's Toad



The Don Watershed Regeneration Council is a volunteer, watershed-wide advisory committee established by the Toronto and Region Conservation Authority in 1994 to help restore the Don River watershed to a healthy, sustainable natural environment. The council is composed of community members, elected officials and representatives from municipalities, agencies, businesses, environmental non-governmental organizations and academic institutions located within the Don River watershed. A comprehensive strategy entitled "Forty Steps to a New Don" is being implemented through the efforts of thousands of volunteers and in partnership with municipalities and other environmental groups.

Scientists caution that there is much that we do not know about biodiversity and how ecosystems function. However, our understanding of genetic, species and ecosystem diversity is expanding. As knowledge grows, there is an opportunity to share it widely and use it to support maintenance, recovery and rehabilitation efforts, as well as to tell us why, where and how species are failing and ecosystems are losing resiliency. Scientists have also begun to work with Aboriginal people to ensure that Traditional Ecological Knowledge is available for decisions on biodiversity.

Forest-dwelling Woodland Caribou

5.0 Addressing Ontario's Biodiversity Challenge (2005-2010)

Ontario's Biodiversity Strategy is an "umbrella" strategy that aims to identify, at a strategic level, a series of actions that, taken together, will enable Ontario to achieve its biodiversity conservation goals:

- To protect the genetic, species, and ecosystem diversity of Ontario
- To use and develop the biological assets of Ontario sustainably, and capture benefits from such use for Ontarians.

The strategy includes the following strategic directions. Specific recommended actions are then grouped under each strategic direction. The recommended actions that support the strategic directions collectively address the threats to Ontario's biodiversity described in Chapter 3.

Engage Ontarians – Our success will depend on the values that guide how Ontarians behave. We must build a broad public understanding of and a commitment to biodiversity, and develop a variety of ways in which people can participate in maintaining our natural heritage as a legacy for future generations.

Promote Stewardship – Private landowners, farmers and non-farmers alike, have a key role to play in the stewardship of the biological resources of this province, particularly in southern Ontario. Private resource-based companies operating on Crown land in northern Ontario also have a key role in the sustainable use and conservation of biodiversity.

Above, left
Sugar Maples,Silent Lake Provincial Park

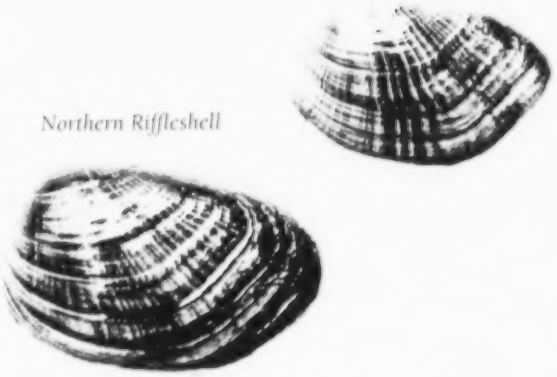
Work Together – No one agency or organization retains the scientific expertise, the legal authority, or the financial resources to care for all of Ontario's biodiversity. Partnership is an important tool in the protection and sustainable use of biological assets. This strategic direction overlaps all the others. If this strategy is to be successfully implemented, a broad coalition including private landowners, academic institutions, non-government organizations (NGOs), industrial sectors, urban and rural communities, Aboriginal communities, all levels of government and individual Ontarians must work together.

Integrate Biodiversity Conservation into Land Use Planning – We need to plan growth carefully in southern Ontario. There is an urgent need to recognize in our planning rules and processes the importance of green spaces and conserving biodiversity.

Prevention – Reducing threats now will be more effective and less expensive than trying to recover what we have lost. There are many threats to biodiversity and action must be taken on a number of fronts. Where there is a threatened imminent loss of biodiversity, we should act, even if our knowledge is not complete. An area can be considered for development at a later date; however once an area has been developed, future options to protect the area's biodiversity may be limited or eliminated.

Improve Understanding – We must make use of expanding scientific knowledge and new mapping and other technologies that make information analysis and sharing faster and more effective. But knowledge is not always about the "new". Traditional knowledge from Aboriginal cultures and rural communities should be valued and integrated into decision-making.

Included in the actions listed below are new initiatives that have been announced and/or initiated since 2003 by the current Ontario government in response to concerns of Ontarians that relate to biodiversity. The recommended actions are numbered, but not in order of priority.



Northern Rifflcshell

5.1 Engage Ontarians

We must increase awareness of the importance of biodiversity and participation in conservation initiatives. A societal commitment to and participation in the care and management of biological assets will in large measure depend on how well we educate Ontarians of all ages about biodiversity and how well we communicate with the public. This strategic direction will be pursued by:

- Increasing awareness of biodiversity
- Strengthening education on biodiversity.

Increasing Awareness

The support of Ontarians is fundamental to the success of this strategy. Individually and collectively, our decisions and actions are crucial to the conservation, including sustainable use, of biodiversity. There are challenges both in trying to create awareness in people about an issue and in trying to stimulate action. While many Ontarians are interested in environmental protection, biodiversity is not generally a top-of-mind issue. We need to improve public understanding of the importance of biodiversity in sustaining life, the effects of human activities on biodiversity, how to prevent or reverse the current decline in biodiversity, and how each and every one of us can contribute to the conservation of biodiversity.

1. Create an Education and Awareness Task Team that fosters multi-partner collaboration to promote community-based biodiversity education and awareness and environmental citizenship by developing an implementation plan for education and awareness to:
   - Engaging NGOs, industry, government, Aboriginal peoples, communities, rural landowners and the public in the implementation of the Ontario Biodiversity Strategy (e.g., Volunteers for Nature, Pond Watch, Christmas Bird Counts)
   - Strengthen education and awareness programs about the importance of biodiversity, causes of biodiversity loss, its protection and sustainable use
   - Provide guidance and resources to existing non-formal educational programs (e.g., interpretive programs, Ontario Agri-Food Education, Conservation Authorities, Science North, museums, Toronto Zoo, botanical gardens).

Strengthening Education

Our greatest hope for change in attitudes and behaviours is the generation that is growing up now. We must instill in our children a conservation ethic and an understanding of what sustainable living means in their lives and for their futures. Education in biodiversity must start early in the education system, and be sustained through secondary school. Ontario must also train the next generation of biologists, zoologists, foresters, farmers and other scientists and practitioners. Generating interest in these fields in school will encourage more young people to enrol in post-secondary programs.

2. Encourage further development of curriculum support materials by the Ontario education community to enhance biodiversity education by:

- Supplying the Ministry of Education with science information in a useable form
- pporting further professional development activities that assist teacher/educators to incor- biodiversity messages
- ng youth with opportunities to apply their knowledge in field situations (e.g., 4H ms, Ontario Stewardship Rangers).

5.2 Promote Stewardship

The majority of Ontario's species at risk are found in southern Ontario where most land is privately owned. The support of private landowners is crucial to achieving the goals of this strategy. We can promote stewardship through effective education, tools and support for landowners. We can also encourage it through incentive programs. Under this strategic direction, we address:

- Engaging private landowners
- Improving incentive programs.

Stewardship education in southern Ontario

Engaging Private Landowners

Gaining the support of private landowners for conservation, protection and recovery initiatives is critical to achieving our vision. With agricultural land constituting a significant portion of southern Ontario's landbase, enhanced efforts to conserve Ontario's biodiversity must recognize the needs of working farms. For example, problem wildlife (e.g., white-tailed deer, giant Canada goose) are an increasing concern for some farmers.

Private sector associations and conservation organizations have effectively initiated and supported some of the most important stewardship activities in the province. Their actions occur both independently of and in partnership with government agencies. There is a need to improve coordination between stewardship organizations and coordination of conservation and education activities at the community level.

3. Enhance and promote private land resource stewardship and biodiversity conservation by:

- Establishing a Biodiversity Stewardship Working Group to identify annual stewardship priorities
- Communicating what biodiversity conservation means in the context of private land ownership and existing practices
- Developing and promoting best management practices for the conservation of biodiversity on agricultural and other private lands
- Developing a strategy for the management of problem wildlife in cooperation with the agricultural community
- Improving technical assistance and the stewardship support tools available to landowners/farmers where needed (e.g., work sheets, extension notes)
- Seeking ways to strengthen existing stewardship organizations (e.g., Ontario Stewardship Councils, Conservation Authorities, the Ontario Heritage Foundation, Land Trusts, NGOs)
- Creating recognition programs to profile exemplary stewardship actions by farmers and other landowners.

Lake Erie Water Snake

Under a federal-provincial-territorial agreement signed in June 2002, a new Agricultural Policy Framework has been developed covering business risk management, food safety and quality, renewal, science and innovation and environment. A Canada-Ontario Implementation Agreement was subsequently signed in December 2003. The environment, including biodiversity, is now an integrated component of agricultural policy in Canada.

Under this new agreement, federal funding from Agriculture and Agri-Food Canada will be available through March 2008 for programs that facilitate on-farm environmental improvements in Ontario. The four programs are: the Canada-Ontario Environmental Farm Plan Program, an education program facilitating the preparation of such plans; the Canada-Ontario Farm Stewardship Program, which includes funding for biodiversity projects; the Canada-Ontario Greencover Program, which provides funding for riparian buffers, shelterbelts and land conversion; and the Canada-Ontario Water Supply Expansion Program, which applies to sustainable agricultural water supplies.

4. Promote the preparation of Environmental Farm Plans and the adoption of best management practices that contribute to biodiversity conservation on Ontario farms through cooperative work among farm organizations, conservation organizations and the federal and Ontario governments by:
   - Implementing the Canada-Ontario Implementation Agreement under the Agricultural Policy Framework to achieve improvements in biodiversity conservation on Ontario farms
   - Providing incentives under the Canada-Ontario Farm Stewardship Program and Canada-Ontario Greencover Program to support the adoption of beneficial management practices that contribute to biodiversity conservation.

Promoting responsible stewardship goes beyond the individual landowner and involves entire business sectors in pursuing biodiversity conservation, including sustainable use.

An innovative approach to promoting the sustainable use of the Crown's forests in northern and central Ontario is forest certification. Various forest certification systems tell consumers that they are buying products that come from forests that meet the sustainable use management standards of the certifying organization.

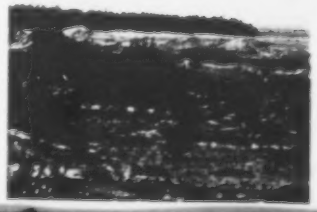
5. Promote the adoption of best practices and environmental management systems by major business sectors to enhance the conservation of biodiversity and the sustainable use of biological resources (e.g., ISO 14000-EMS, Forest Certification).

Improving Incentive Programs

Well-designed incentive programs to support biodiversity conservation and the sustainable use of biological resources are important tools on private property and can be supported by legislation when necessary.

The Conservation Land Tax Incentive Program currently provides tax relief to individual private landowners and non-profit charitable organizations who agree to protect the significant natural heritage values of their properties. In December, 2004, the Ontario government announced that this incentive program would be expanded to make additional categories of land eligible for the tax exemption.

The Managed Forest Tax Incentive Program (MFTIP) encourages private landowners, through a reduction in property tax, to conserve and manage their forested land sustainably. In December 2004, the Ontario government also announced the establishment of a committee to provide advice on a new assessment method (similar to the approach used for farmlands) for application to forest properties enrolled in MFTIP.



6. Enhance incentives for landowners to practise resource stewardship and the conservation of biodiversity by amending the Assessment Act and updating regulations pertaining to the Conservation Land Tax Incentive Program and the Managed Forest Tax Incentive Program, consistent with the government's December 2004 announcement.

There are other programs promoting stewardship on private land. These programs may involve government, NGOs and/or private sector organizations. We need to take stock of what is working effectively in Ontario and elsewhere, and be creative in identifying some new solutions that will make a difference to the conservation of biodiversity. The Alternative Land Use Services pilot project in Norfolk County has the potential to become an innovative conservation delivery model, with its farm, rural community and ecosystems focus.

7. Explore opportunities over time to improve incentive programs and to use other mechanisms to support private land stewardship by:
   - Monitoring and evaluating the effectiveness of existing grants and incentive programs
   - Learning from creative financial and non-financial incentive programs in other jurisdictions for possible application in Ontario (e.g., Safe Harbour Program)
   - Identifying the potential for partnerships and/or harmonization within and between government and non-government grants and incentive programs.

Sand dunes at Desert Point, Great Duck Island, Manitoulin

5.3 Work Together

Working together makes our efforts more effective. Partnerships are and should be used in many ways for many purpose – in education, research, policy development, technology development, information management, conservation projects, monitoring and compliance. While working together is part of all the other strategic directions, there are two specific issues dealt with here:

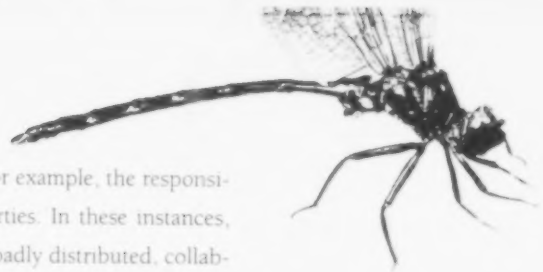
- Providing a structure for cooperation and priority-setting
- Addressing the need for greater institutional coordination.

There are many initiatives related to biodiversity that are happening in Ontario now. But there is not a designated body to set priorities, ensure action on the key components of this strategy, coordinate activities, and perform various monitoring and reporting functions. To ensure a focused effort on biodiversity goals going forward, it is recommended that a Biodiversity Council be established.

8. Establish a broad-based Ontario Biodiversity Council to guide implementation of Ontario's Biodiversity Strategy, and to:

- Involve the public, Aboriginal peoples and a wide range of stakeholders in identifying a set of annual implementation priorities
- Coordinate implementation planning in association with other groups (e.g., Education and Awareness Task Team (#1), Biodiversity Stewardship Working Group (Action #3) and Ontario Biodiversity Science Forum (#28)
- Build shared accountability by encouraging improved partnerships and collaboration to advance implementation
- Evaluate progress and report on implementation annually, with emphasis on the year's priorities
- Lead a five-year review of the strategy and its implementation, and preparation of an updated strategy for 2010-15.

Caspian Tern
c. Don Sutherland, MNR



Mocha Emerald

Better institutional coordination is also required to support implementation. For example, the responsibility for managing aquatic biodiversity effectively is shared among many parties. In these instances, where mandates, expertise and legislative, policy and management tools are broadly distributed, collaborative efforts with clear protocols and partnerships to enable the most effective use of available capacity and information are essential. The Ontario Biodiversity Council should help to facilitate this effort.

9. Strengthen communication and coordination within and between governments (municipal, provincial, federal and international), Aboriginal peoples, NGOs, the agricultural community, the private sector, and other groups on initiatives/issues affecting Ontario's biodiversity, using existing mechanisms where possible.

5.4 Integrate Biodiversity Conservation into Land Use Planning

Land use planning involves consideration of a variety of values, including biodiversity and economic development. While the following text is focused on the biodiversity component, it is recognized that other components and values will also be considered in land use planning decisions.

A broad vision of the landscape is needed to provide a context for biodiversity conservation. Biodiversity conservation must be built into all aspects of land use planning. To protect some of the most critical land areas and watersheds, the provincial government must use legislation and policy direction. But there are additional ways to improve the integration of biodiversity into land use planning, including better access to information, more clarity in guidelines, and more technical and other supports for local planners and decision-makers on how to safeguard important natural heritage features and systems effectively, while maintaining the economic and social viability of their communities.

In some parts of southern Ontario, urban areas are experiencing rapid growth. Settlement areas are expanding outward at a rapid rate and consuming large tracts of agricultural land and natural areas to provide for low-density settlement. The challenge in these areas is to plan and accommodate new growth in a way that minimizes its potential footprint, so as to increase the opportunity to conserve farmlands, other green spaces, and biodiversity.

For example, the draft growth plan for the Greater Golden Horseshoe provides policy direction to identify a natural system to enhance the conservation of valuable resources and to connect with the greenbelt plan. It recognizes the importance of a natural system in maintaining biodiversity.

10. Enact and implement a legislative framework that will guide the preparation of growth plans in Ontario to enable decisions about growth to be made in ways that sustain a robust economy, build strong communities and promote a healthy environment and a culture of conservation.

The Ontario government has already moved forward with new greenbelt legislation and an updated Provincial Policy Statement.

11. Implement the Greenbelt Protection Act and its related greenbelt plan to enhance the conservation of biodiversity by:

- Generally protecting greenspaces and farmland within the Greenbelt's Protected Countryside area
- Identifying and protecting a Natural Heritage System, including Key Natural Heritage Features and Key Hydrologic Features
- Preventing the expansion of settlement areas within the Natural Heritage System and Specialty Crop areas
- Supporting connectivity within the Natural Heritage System and between key features.

12. Implement the 2005 Provincial Policy Statement under the Planning Act to ensure effective direction to promote managed growth, sustainable development, a strong economy and a healthy environment.

13. Update provincial guidelines that encourage the enhanced integration of the conservation of biodiversity (including related water quality measures) into municipal land use planning decisions, including the guidelines for "Significant Habitat" and "Natural Heritage" for municipal planning to address gaps and/or inconsistencies.

14. Improve public, private and NGO access to available biodiversity information (e.g., species at risk, natural heritage values) and technical guidelines to inform land use decisions (e.g., Source Water Protection Plans, Watershed Plans, Municipal Official Plans).

5.5 Prevention

Preventative actions are required in a number of areas. We have identified actions to address the following subjects during the first action plan for Ontario's Biodiversity Strategy:

- Air and water pollution
- Invasive species
- Species at risk
- Genetic diversity
- Ecosystem representation and integrity
- Compliance and enforcement.

Budreau's Beach on Lake of the Woods

Air and Water Pollution

15. Reduce the impact of pollution on biodiversity by implementing Ontario's plans for clean air, land and water through initiatives such as Ontario's Clean Air Action Plan, Nutrient Management, watershed-based Source Water Protection and actions under the Canada-Ontario Agreement for Great Lakes Water Quality.

16. Enact and implement source water protection legislation to both protect water quality and quantity, and enhance the conservation of biodiversity.

Invasive Species

Species introductions are a global issue, affecting biodiversity, the environment, economies and trade. In some cases, the introduction of species can be beneficial to society. For example, much of the food we eat has been derived or comes from introduced species that are not considered invasive.

Within Ontario, the Great Lakes Basin is the area most affected to date by invasive species due to its high human population and high degree of industrialization, and the associated demand for offshore commodities. Arriving by ship, train, air and truck these shipments of commodities have a growing potential to introduce species that can be invasive.

Once introduced, these species can spread within Ontario through a variety of pathways. For example, the larvae of invasive species such as the emerald ash borer and Asian long-horned beetle can be moved unintentionally hundreds of kilometres within firewood from an individual's home property to their cottage or to a provincial park.

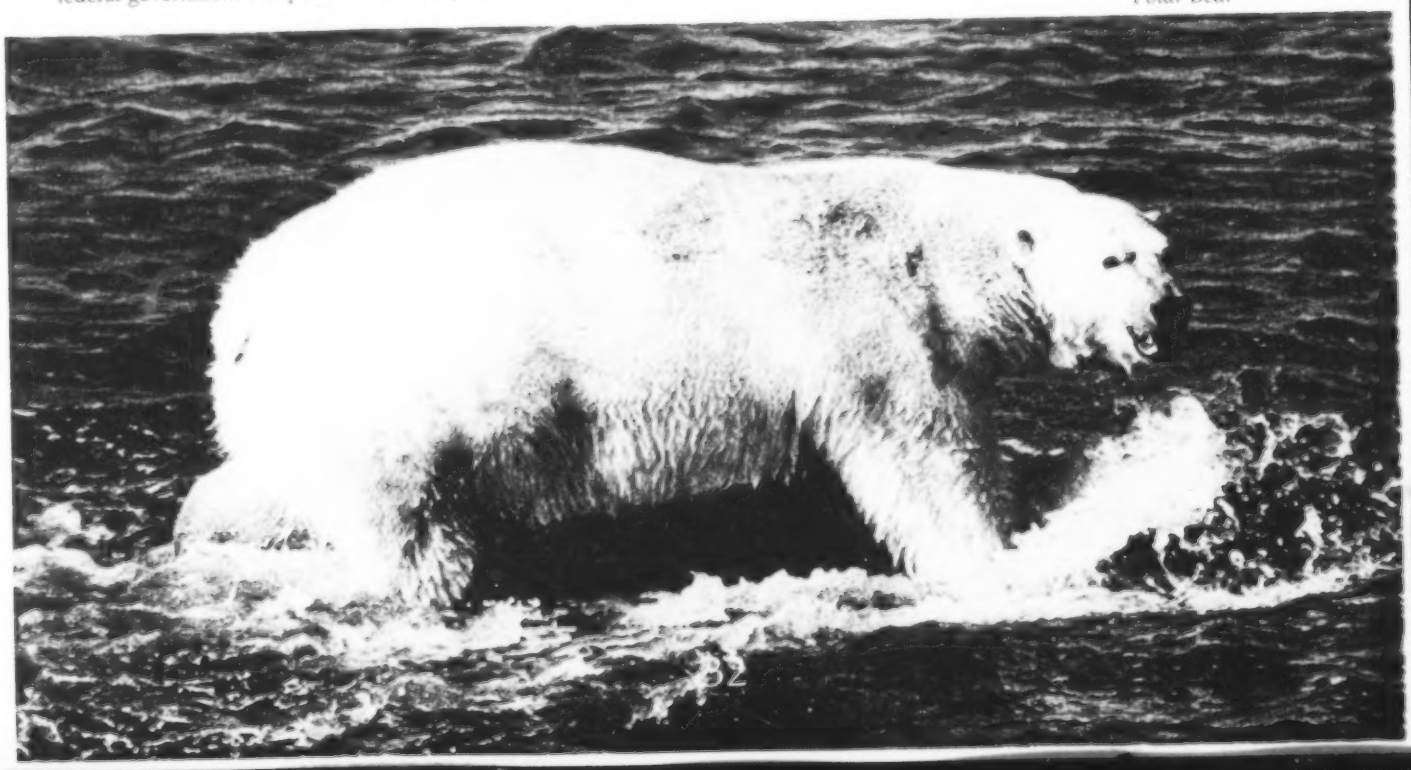
17. Complete the Canadian Alien Invasive Species Action Plan (under the Canadian Alien Invasive Species Strategy) and implement the action plan in Ontario by (but not limited to):
    - Preventing introductions of invasive species through the identification and management of high risk pathways (e.g., ballast water, shipping containers, nurseries), and bans on high risk species (e.g., Asian Carp)
    - Improving capability to assess risks of invasions
    - Building capability to quarantine where necessary
    - Enhancing early detection capacity, especially in high risk areas
    - Taking rapid action to eradicate invasive species
    - Limiting the spread/impacts of invasive species that cannot be eradicated
    - Communication and education.

Species at Risk

Ontario currently has 172 species at risk (10 extirpated, 72 endangered, 44 threatened and 46 of special concern). We need to reduce the probability that additional species will become at risk and, through time and recovery efforts, reduce the number of species currently at risk.

Recovery of species and ecosystems is an important component of protection, but defining the bounds of recovery efforts is a challenge. Goals for recovery need to be established for each species (or ecosystem) individually, based on a number of factors, including the consideration of what is feasible and realistic to achieve. Ontario is committed to updating its species at risk legislation and programs to complement federal legislation and programs. Ontario is also developing a bilateral agreement with the federal government on species at risk cooperation.

Polar Bear



18. Review and update Ontario species at risk legislation to provide broader protection for species at risk and their habitats, and to include requirements for recovery planning, assessment, reporting and enforcement.

19. Implement the National Accord for the Protection of Species at Risk and the associated framework in Ontario by working in partnership with private landowners, municipalities, conservation groups and business sectors to:

- Protect species at risk and their habitats
- Prepare and implement recovery plans in a timely fashion (multi-species/ecosystem-based where possible)
- Participate in the Canadian Endangered Species Conservation Council.

Genetic Diversity

Humans rely on biodiversity and its genetic foundation as an invaluable source of biological goods and services. In Ontario, it is the source of diverse livelihoods and natural resources (e.g., fisheries, forestry, agriculture, recreation and tourism).

The genetic foundation of biodiversity holds opportunities to maintain and improve our health and quality of life (e.g., discovery of new medicines and foods). Conserving genetic diversity is important for both native species and species valued for agriculture, forestry, fisheries, and recreation. *In-situ* (e.g., within natural habitat such as a forest) conservation is preferred while *ex-situ* (e.g., zoos) conservation, as an alternative approach, is supported when in-situ is not possible.

20. Strengthen institutions and partnership arrangements related to the conservation (including ex-situ) of genetic diversity (e.g., Forest Gene Conservation Association, Seeds of Diversity, Rare Breeds Canada, Toronto Zoo and Trent University DNA Cluster Partnership).

21. Support the development of a national approach on access to and the sharing of benefits from genetic resources, working with the federal government, other provinces and territories, Aboriginal peoples and interested stakeholders.

Ecosystem Representation and Integrity

Ensuring that there are representative natural areas protected across Ontario is another key component to conserving the province's biodiversity. More than 40 types of international, national, provincial, municipal, and private protected area designations have been established in Ontario. These areas are managed by dozens of organizations including the Ministry of Natural Resources, the Ontario Heritage Foundation, Conservation Authorities, Parks Canada, municipalities, land trusts, conservation organizations, private landowners, and others.

There are significant differences in the degree to which natural features are represented within regulated protected areas across the province. For example, 10.7 per cent of the Hudson Bay Lowlands Ecozone is protected. Since nearly all of this area is within Polar Bear Provincial Park, many natural features in the Hudson Bay Lowlands Ecozone are not adequately represented.

Following the Living Legacy Land Use Strategy, regulated protection of the Ontario Shield Ecozone also stands at 10.7 per cent. These protected areas are fairly well distributed among natural features, though some earth and life science features are still under-represented.

The Mixedwood Plains Ecozone of southern Ontario has the greatest species diversity, the most pressures, and the highest proportion of private land ownership. Public protected areas account for only 0.6 per cent of this ecozone, and many are too small or not sufficiently interconnected to support the persistence of some species and natural processes. Here, protection of natural heritage values relies heavily on private land stewardship, municipal planning, conservation authorities, and non-governmental organizations.

The portion of Ontario's freshwater area that is protected is very low. To date, identifying and regulating freshwater protected areas in Ontario has been largely incidental to terrestrial protection efforts. However waterway class provincial parks such as Turtle River and Missinaibi provide protection to watercourses and shoreline areas. A framework for assessing aquatic ecosystem representation is being developed.

22. Seek opportunities to establish protected areas that contribute to the completion of a well-designed system of protected areas representative of Ontario's ecosystems:

- In southern Ontario, through stewardship partnerships, securing important private and public properties, and review public lands to determine the potential to establish, and connect where possible, representative protected areas
- In the Ontario Shield Ecozone, through the Room To Grow process under the Ontario Forest Accord
- In the Hudson Bay Lowlands and northern boreal region, through cooperative planning approaches such as the Northern Boreal Initiative
- In the Great Lakes, through international, national and provincial agreements and legislation.

Prairie Smoke, Carden Plain

The legislation that applies to Ontario's protected areas (i.e. provincial parks, conservation reserves and wilderness areas) is currently undergoing its first review in 50 years. The focus of the review includes permanent protection and ecological integrity.

23. Enact updated provincial protected areas legislation that enhances ecological integrity and implement the updated legislation by:

- Reviewing and updating provincial protected areas policy accordingly
- Working with partners to develop a framework for the preparation and/or updating of management direction for national, provincial and municipal protected areas.

24. Work to re-establish and/or retain natural linkages and connectivity on the landscape between natural areas, including protected areas, with a high priority on reducing landscape-level habitat fragmentation in southern Ontario, through the securement of lands by such mechanisms as conservation easements, donation, purchase, protected areas and/or long-term leases (e.g., Great Lakes Conservation Blueprint, Big Picture 2002, Algonquin to Adirondacks, Greenways Strategy, Conservation Authorities and the Ontario Heritage Foundation).

25. Develop a natural spaces initiative for southern Ontario to help Ontarians conserve and restore over time a network of natural systems (land and water) that:

- Will support provincial and municipal land use planning initiatives
- Respects private landowners' interests by working with willing landowners on a voluntary basis
- Recognizes the need for strategic public investment and incentives.

A landscape perspective (including landscape patterns, age class structures and ecosystem composition) is also important for understanding and managing Crown forests. The development of a landscape management perspective requires a shift from the current approach of managing for specific (i.e. featured) species to a new approach that maintains a natural range of forest structure and composition at all scales across the forested landscape (sometimes known as a coarse/fine filter approach).

26. Continue to update Crown forest management guides to provide more effective and efficient direction on biodiversity conservation at the landscape, forest stand and site scales.

Compliance and Enforcement

Finite compliance and enforcement resources need to be focused on potential high-risk areas.

27. Review compliance and enforcement plans and assign a higher priority to ensuring compliance with legislation that protects biodiversity and its sustainable use (e.g., Endangered Species Act, protected areas legislation, Crown Forest Sustainability Act, Planning Act, Oak Ridges Moraine Conservation Act and Greenbelt Act).

5.6 Improve Understanding

We must continue to discover, retain, use and share new knowledge and information about the composition, structure and function of ecosystems and the impacts of people who live and work in them. People must have the best information available to make the best decisions as they apply to biodiversity.

Our understanding of Ontario's biodiversity is incomplete. Considerable information and interpretation of biodiversity have accumulated, but it is recognized that our knowledge of this complex subject must be improved.

The co-ordination and integration of scientific effort, traditional ecological knowledge and information management for biodiversity requires developing knowledge partnerships and a process that is inclusive and transparent. Allocation of effort and resources is required to address critical biodiversity knowledge gaps and to integrate traditional ecological knowledge.

28. Establish an "Ontario Biodiversity Science Forum" (that includes but is not limited to academia, museums, government, Aboriginal peoples, industry and non-governmental organizations) to focus the biodiversity science agenda and foster science partnerships by identifying knowledge gaps and recommending science priorities in areas such as:

- Improving our understanding of ecosystem functions and relationships (e.g., interspecific and intraspecific competition, predator-prey relationships, population-habitat linkages, impacts of problem wildlife and reintroduced wildlife on agriculture, taxonomy, genetic diversity, light pollution)
- Evaluating existing and aiding the development of new habitat/ecosystem and species/population management guides, best management practices and other conservation tools
- Improving our understanding of the economic and non-economic valuation of biodiversity
- Identifying gaps in available expertise (e.g., Ontario taxonomy/systematics) and recommending solutions to address such gaps
- Supporting enhanced training (i.e., science and technology transfer).

29. Work in partnership with Aboriginal peoples and organizations to integrate traditional ecological knowledge into decisions about biodiversity conservation.

The distribution of biodiversity will continue to shift in response to changing environmental conditions (e.g., climate change), human-induced alterations to the landscape (e.g., residential and industrial development) and resource use.

30. Continue to review new monitoring information and knowledge to ensure that the use of biological assets (e.g., forests, wildlife, fish, and water) is sustainable, biodiversity is conserved and ecological integrity is maintained.

Given the inherent complexities of species and ecosystems, together with the inordinately high economic cost of recovery actions, it is paramount that degradation or loss of species and communities be prevented. The early identification of species or ecosystems at risk is vital if prevention measures are to be undertaken. In addition, we need enhanced capacity to assess the risks from invasive species, reintroductions and genetically modified organisms.

31. Enhance the current risk assessment capability in Ontario so that ecological, social and economic risks to biodiversity from threats such as climate change, invasive species, reintroductions and the release of genetically modified organisms can be better evaluated, and so that priorities for contingency plans and response teams can be identified.

32. Develop and implement pathogen (i.e., wildlife and plant diseases) surveillance, prevention and emergency response protocols, based on the relative risk of various diseases (e.g., Chronic Wasting Disease in ungulates, Avian Vacuolar Myelinopathy in eagles, Sudden Oak Death, Soybean Rust) to wildlife populations, crops and humans, and support research programs that improve risk assessments and develop response options.

We need to work in partnership to monitor and report on the state of Ontario's biodiversity over time. Volunteer organizations such as naturalists' clubs can play key roles in specific inventories. Biodiversity indicators or indices need to be chosen so that the condition of biodiversity in Ontario can be assessed.

Silver Maple Swamp, Geneva Park

33. Report on the "State of Ontario's Biodiversity" every five years and issue a first report by 2010 that will:

- Describe biodiversity reporting standards (criteria and indicators)
- Establish benchmarks for biodiversity in Ontario to allow future reports to track progress in meeting conservation (protection and sustainable use) goals
- Identify challenges, risks, threats and opportunities (e.g., the Ministry of Natural Resources' State of Resources Reporting program,Ontario Breeding Bird Atlas)
- Be preceded by a brief interim report within two years.

34. Review and implement improved inventory, monitoring and assessment programs to support public reporting on the "State of Ontario's Biodiversity" and to improve the establishment of baseline information and tracking trends through time related to species/ecosystem status and land cover change.

35. Strengthen the Natural Heritage Information Centre partnership to manage (receive, process and share) biodiversity information and establish mechanisms and protocols that streamline the sharing of data on species, biological communities and ecosystems, while protecting the security of sensitive data.

5.7 Reviews

Through the process of developing this strategy, a number of subject areas related to other legislation and/or policy direction were identified where further review is needed before any potential directions can be defined and recommended.

36. Review other relevant legislation and regulations to identify gaps and issues (e.g., disincentives), and the need for potential changes in the legal framework for the conservation of biodiversity (protection and/or sustainable use of biological resources). The review may include (but is not limited to):

- Land trust, and conservation easement legislation
- Species of increasing conservation concern (e.g., Canada yew, wolves)
- Native wildlife, plants, invertebrates
- Critical habitat and sensitive natural heritage features
- Invasives, through high-risk pathways, and pathogens.

37. Review other relevant resource management and planning policies to identify and address policy gaps and issues (e.g., disincentives) related to the conservation of biodiversity (protection and/or the sustainable use of biological resources). The review may include (but is not limited to):

- A classification system for aquatic areas including the Great Lakes
- Sustainable management of harvested wildlife including those harvested plant and animal species for which harvest regulations are currently not in place
- Management of introduced species for recreation and/or farming
- Strategies to reduce damage associated with problem wildlife populations, especially in agricultural areas
- Working with interested landowners on trail planning and delivery
- Conservation of genetic diversity
- Appropriate accessibility to property assessment data (e.g., sites of conservation interest)
- Improving the effectiveness of multi-ministry input into municipal planning.

Aerial view of Kawartha Highlands Signature Site

6.0 Moving Forward

This section of the strategy identifies a list of proposed priorities for action in 2005 and discusses some important considerations about how Ontario's Biodiversity Strategy is implemented. People who have participated in the development of this strategy indicated a strong preference for continuing to work together in an open and inclusive process, and for broadening the participation of the public, Aboriginal peoples, stakeholders, academics and government agencies. A first step in this process would be the creation of an interim Ontario Biodiversity Council to provide direction on 2005 action priorities and guide implementation. The finalization of this section of the strategy will depend on agreement to form an interim council and consensus of the interim council members on priorities and on how the strategy will be moved forward.

Priority Actions for 2005

This sub-section lists the proposed priorities for implementation in 2005 from the actions in Section 5 (please refer to the full action statements in Section 5 for action details), based on initial discussions with the proposed interim council. The priorities will be discussed, adjusted if necessary, and approved by the interim council:

1. Ontario Biodiversity Council (Action #8)
2. Education and Awareness Task Team (Action #1)
3. State of Ontario's Biodiversity (Action #33)
4. Private Land Stewardship (Action #3)
5. Greenbelt Protection Act (Action #11)
6. Natural Spaces Initiative (Action #25)
7. Curriculum Support Materials (Action #2)
8. Incentives for Landowner Stewardship (Action #6)
9. Provincial Protected Areas Legislation (Action #23)
10. Source Water Protection Legislation (Action #16).

The Importance of Partnerships for Implementation

This strategy indicates that the protection and sustainable use of Ontario's biodiversity is a shared responsibility for all Ontarians. The involvement of all Ontarians is necessary if we are to achieve our vision. Partnerships between all organizations – government agencies, Aboriginal peoples, environmental groups, industries, associations, universities and others – are a vital part of working together. Each organization brings a mixture of the expertise, skills, information and resources that are necessary to implement successfully the actions that we agree to take together. Continuation of the open and inclusive process for discussion won't be easy – the values and interests of people and organizations may differ and conflict – but it will support the identification of shared interests and the formation of partnerships.

The Importance of Involvement of Aboriginal Peoples

Aboriginal peoples have depended on biodiversity for food, shelter, cultural and spiritual purposes for thousands of years, and indigenous communities continue their relationship with the land and its resources today. Section 5 identifies the need to work with these communities to make their knowledge and expertise available for decisions about biodiversity. The involvement of Aboriginal peoples is critical to the successful implementation of this strategy. The World Commission on Environment and Development emphasized in 1987 the importance of preserving traditional knowledge, while the *Convention on Biological Diversity* and the *Canadian Biodiversity Strategy* reinforce the need to respect, preserve and maintain the knowledge innovations and practices of Aboriginal communities and to seek community-based, local responses to the strategy. The existing Aboriginal and treaty rights of Aboriginal peoples are recognized by the Constitution, affirmed by the Supreme Court, and must be respected in implementing this strategy.

The Learning Place, Petroglyphs Provincial Park

Communication

Ontario's Biodiversity Strategy is for all Ontarians. Efforts must be made by the organizations that are represented on the interim council and others to communicate the strategy to the public across the province and to continue to seek broad input and ideas about the directions and actions that are identified in Ontario's strategy. The proposed Education and Awareness Task Team (Action 1) could provide support to such an effort by the council. The process of review and renewal of the strategy in 2010 is a second major opportunity to communicate with the public and organizations and to broaden the dialogue again. Using the strategy as a touchstone for launching the actions, many of which will engage particular sectors of the public that are interested in that specific action, will also communicate the broad direction of the strategy and provide context. Public awareness of biodiversity is critically important to the successful implementation of this strategy. An Ontario Biodiversity Strategy website will provide access to the strategy, implementation plans, annual reports and opportunities for involvement.

Implementation Planning

The proposed priority actions for 2005 provide a starting point for discussions among partners about implementation of each action. The particulars of what will be done, who will do what, the needs for resources (expertise, skills, technology and money), and when the action will be completed need to be defined in an implementation plan for the proposed priority actions. The open and inclusive approach to involving Ontarians and their organizations that has been used to develop the strategy should be continued during implementation. Specific implementation plans will be reviewed by the Ontario Biodiversity Council and posted on the website.

Glossary

Note: Most definitions are from the *Canadian Biodiversity Strategy* (1995) (noted as CBS), or the *Dictionary of Natural Resource Management* (1996) (noted as DNRM).

Alien Species – plants, animals and micro-organisms that have been accidentally or deliberately introduced into areas beyond their normal range. Synonyms may include introduced, non-native and exotic.

Biodiversity or Biological Biological Diversity – the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBS).

Conservation – the maintenance of the Earth's resources in a manner that maintains ecosystem, species and genetic diversity and the evolutionary and other processes that shaped them. Conservation may or may not involve the use of resources; that is, certain areas, species or populations may be excluded from human use as part of an overall landscape/waterscape conservation approach while in other areas the sustainable use of biological resources is permitted (CBS modified).

Ecological Approach – resource planning and management activities that assure consideration of the relationships among and between all organisms, including humans, and their environment (DNRM).

Ecological Integrity – the quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species, and ecosystem diversity assured for the future (DNRM).

Ecological Region – in this strategy refers to one of the three Ontario ecozones (i.e. Hudson Bay Lowlands, Ontario Shield or Mixedwood Plains) or the Ontario portion of the Great Lakes.

Ecosystem Services – services that humans derive from ecological functions such as photosynthesis, oxygen production, water purification and so on (CBS modified).

Ecosphere – that part of the Earth's environment that is able to support life; alternatively the total living community and all systems of the Earth (DNRM modified).

Ecosystem – a dynamic complex of plants, animals and micro-organisms and their non-living environment interacting as a functional unit. The term ecosystem can describe small scale units, such as a drop of water, as well as large scale units, such as the biosphere (CBS).

Ecosystem Health – the condition of an ecosystem, through its structure and functions, that permits the maintenance of biological diversity, biotic integrity and biological processes over time (DNRM modified).

Ecozone– an area of the earth's surface that represents a large ecological zone and has characteristic landforms and climate. Each ecozone is distinguished from others by its unique mosaic of plants, wildlife, climate, landforms, and human activities. In this strategy we briefly describe the three ecozones and the Great Lakes as the four "ecological regions" that comprise Ontario.

Endangered Species – species that are threatened with immediate extinction or extirpation if the factors threatening them continue to operate. Included are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction (CBS).

Ex-situ Conservation – the conservation of components of biological diversity outside their natural habitats, often in such institutions as zoos, museums, botanical gardens, aquariums and gene banks (CBS).

Extirpated Species – species that are no longer found in the wild in the portion of their natural range that is within Ontario but that still exist elsewhere in the world (CBS modified).

Genetically Modified Organism – an organism whose genetic information has been altered by mutagenesis or genetic engineering (CBS modified).

Genetic Resources – genetic material of actual or potential value (CBS).

Habitat – the place or type of site where an organism or population naturally occurs. Species may require different habitats for different uses throughout their lifecycle (CBS).

In-situ Conservation – the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive characteristics (CBS).

Interspecific – between species.

Intraspecific – within a species.

Intrinsic Value – valued for its own sake, not for what they lead to or produce (DNRM modified).

Invasive Species – alien species whose introduction or spread threatens the environment, the economy, and/or society, including human health.

Landscapes – complexes of terrestrial ecosystems in geographically defined areas (CBS).

Principle 15 (the precautionary approach) – In order to protect the environment, the precautionary approach shall be widely applied by States [i.e. jurisdictions] according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (1992 UNEP *Rio Declaration on Environment and Development*).

Protected Area – geographically defined areas that are designated or regulated and managed to achieve specific protection objectives (CBS modified).

Protection – a commitment to protect individuals, a subpopulation or a population, or ecosystems (or parts thereof) from adverse impacts that may result in their loss.

Rare Species – small populations of species that are not currently endangered, threatened or of special concern, but may be at risk. These species are usually localized within restricted geographical areas or habitats, or are thinly scattered over a more extensive range. Rarity can be defined locally, regionally, provincially/territorially, nationally or globally (CBS modified).

Recovery – an action that is necessary to reduce or eliminate the threats that cause a species to be listed as threatened, endangered or extirpated (DNRM modified).

Rehabilitation – the return of a species, population or ecosystem to a healthy, functioning state (CBS).

Resilience – the ability of an ecosystem to recover and maintain the desired condition of diversity, integrity, and ecological processes following disturbances (DNRM).

Restoration – the return of a species, population or ecosystem to its state prior to disturbance (CBS).

Species at Risk – any wild plant or animal threatened by, or vulnerable to extirpation in Ontario or extinction. Species at Risk are assigned a designation (i.e. Special Concern, Threatened, Endangered or Extirpated) to represent the degree of imperilment. Note: Six species (i.e. Macoun's Shining Moss, Blackfin Cisco, Blue Pike, Deepwater Cisco, Passenger Pigeon, Eastern Elk), formerly found in Ontario, are extinct (i.e. no longer exist anywhere).

Species of Special Concern – a species that is particularly sensitive to human activities or natural events but is not an endangered and/or threatened species.

Sustainable Development – development that meets the needs of the present without compromising the ability of future generations to meet their own needs (CBS).

Sustainable Use – the use of components of biodiversity in a way and at a rate that does not lead to their long-term decline thereby maintaining the potential for future generations to meet their needs and aspirations. Sustainable use in this strategy refers to consumptive uses of biological resources (CBS).

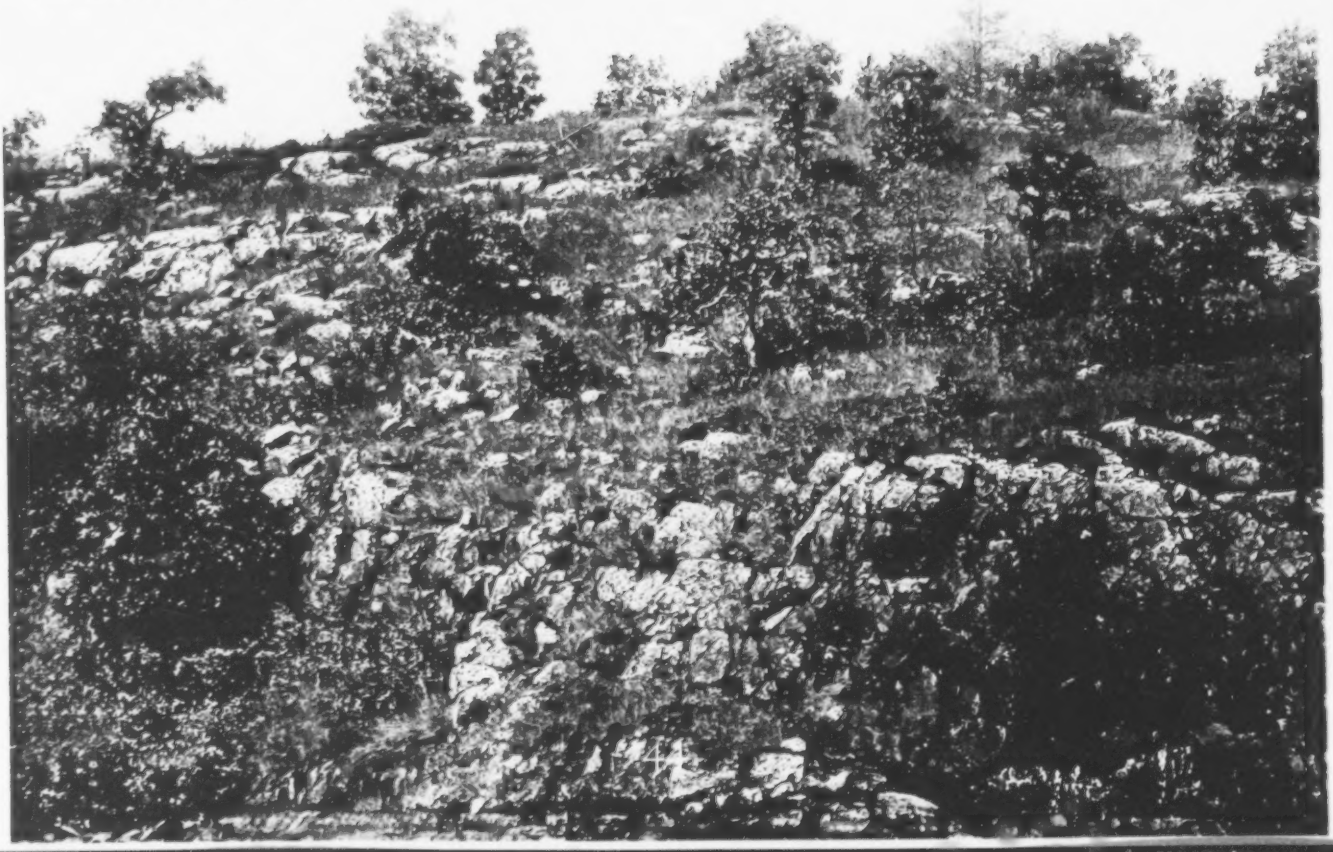
Systematics – the determination of the groups to be used in taxonomic classifications based on evolutionary, genetic, and phenotypic differences or affinities (DNRM).

Taxonomy – a means of classifying living or extinct organisms based on their anatomy, morphology, and biochemical and genetic characteristics. It is often used synonymously with systematics (DNRM).

Threatened Species – species that are likely to become endangered if the natural and/or human pressures limiting them are not reversed (CBS modified).

Traditional Knowledge – knowledge gained from generations of living and working within a family, community or culture (CBS).

Oak Savannah, Lake of the Woods



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